Integrated Collision Avoidance Enhanced GN&C System for Smart Air Vehicles, Phase I

Completed Technology Project (2005 - 2005)

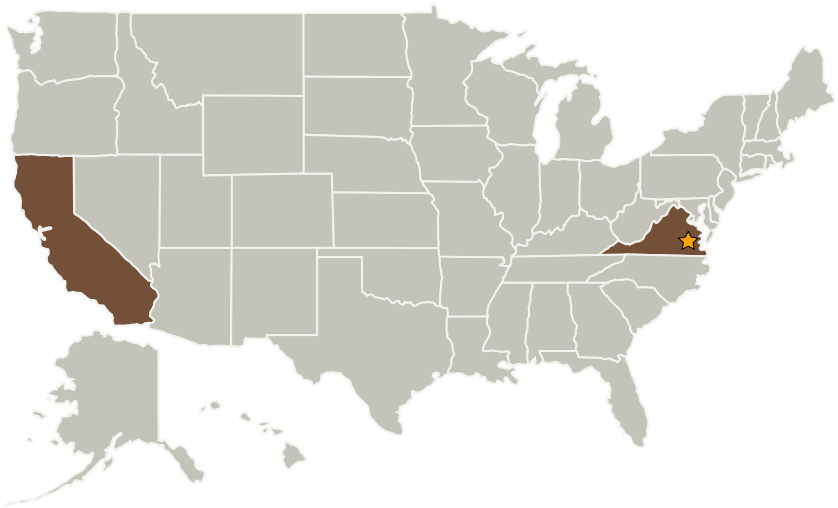
Project Introduction

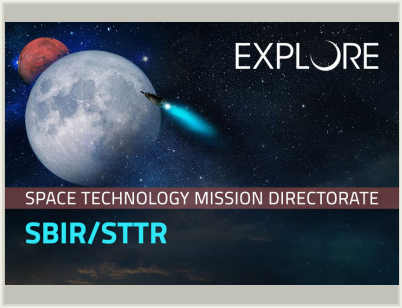
The objective of this SBIR Phase I project is to develop and demonstrate a low cost, lightweight, miniaturized Integrated Collision Avoidance Enhanced GN&C System for Smart Air Vehicles. The proposed system takes advantage of the latest Commercial-Off-the-Shelf (COTS) components, American GNC Corporation's products and patents to achieve an integrated, guidance, navigation, and control (GN&C) micro system for air vehicles, which is capable of assisting aircraft pilots to avoid approach and collision with ground/water and other near objects in flight. The various data from the IMU, GPS chipset, terrain data base, magnetometer, and object detection sensors are processed to produce collision warning audio/visual messages and collision avoidance guidance commands in a closed-loop system. In this Phase I project, the feasibility, as well as functions, specifications, hardware architecture, algorithms and software of the proposed system will be investigated, simulated, and demonstrated.

Anticipated Benefits

In addition to the potential applications for NASA's Enabling Concepts and Technologies program, the proposed GN&C system is also well-suited?due to its small size, low cost, and light weight?to a wide range of NASA systems, including: remote sensing platforms, extravehicular robotic systems, telerobotics, and UAVs. The product developed in this project, Integrated Collision Avoidance Enhanced GN&C System is applicable to several commercial applications including Air Traffic Management (ATM), smart vehicles, and intelligent transportation systems.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
American GNC Corporation	Supporting Organization	Industry Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Simi Valley, California

Primary U.S. Work Locations	
California	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Gary A Fleming

Principal Investigator:

Ching-fang Lin

Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.5 GN&C Systems Engineering Technologies
    - TX17.5.2 GN&C Fault Management / Fault Tolerance / Autonomy